

Fig. 1

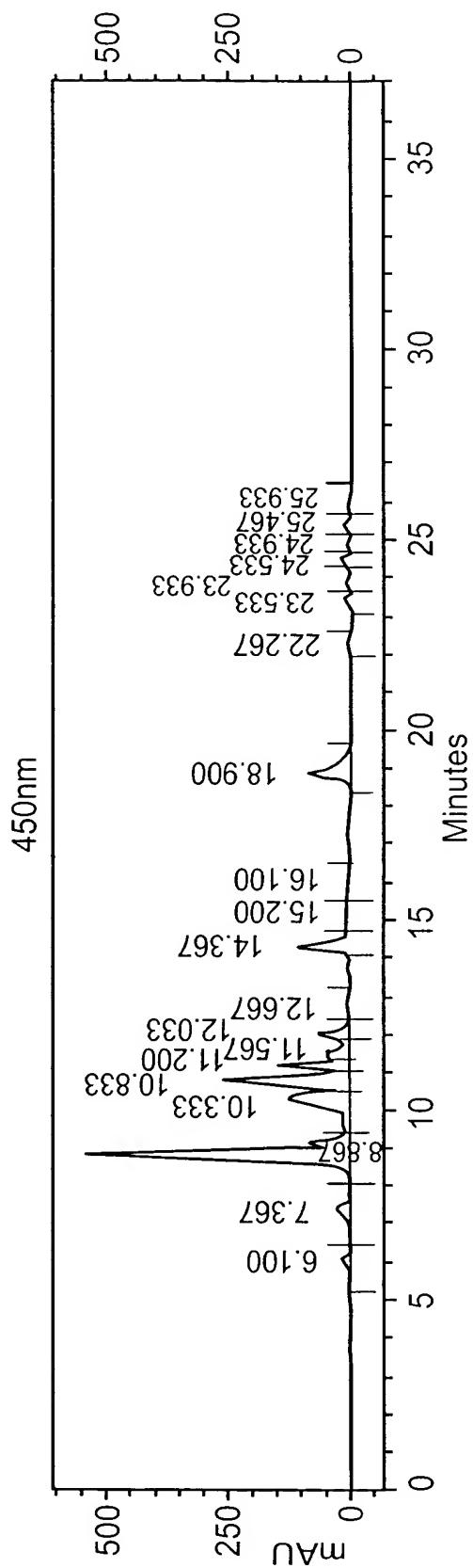
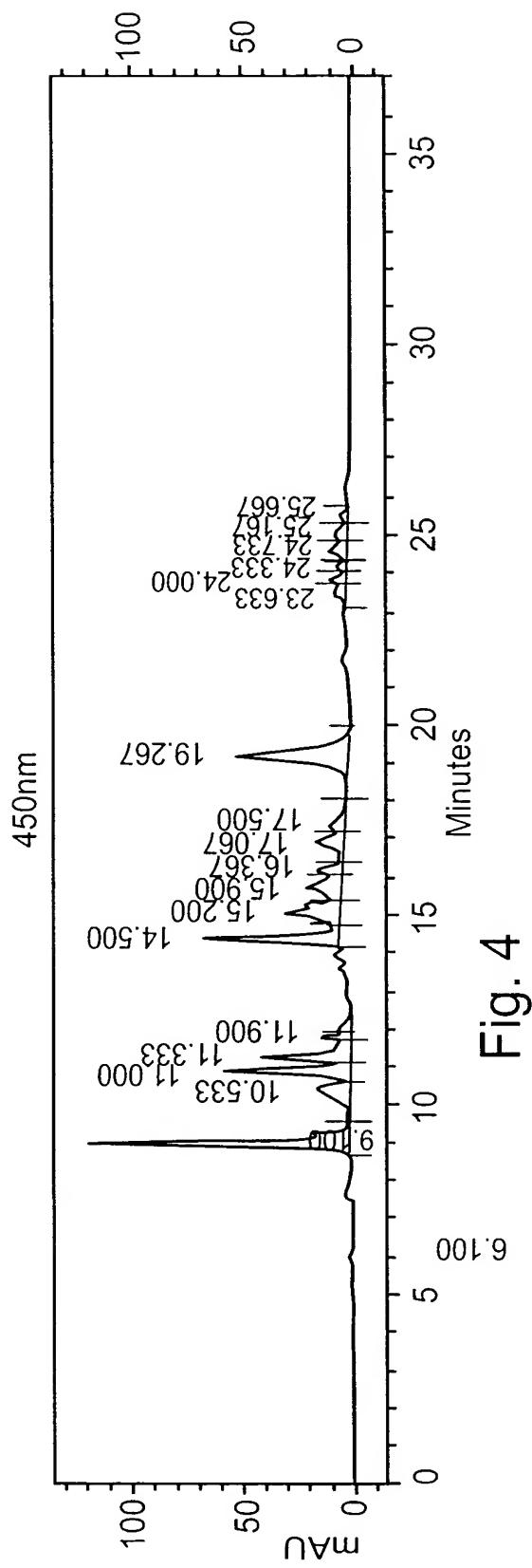
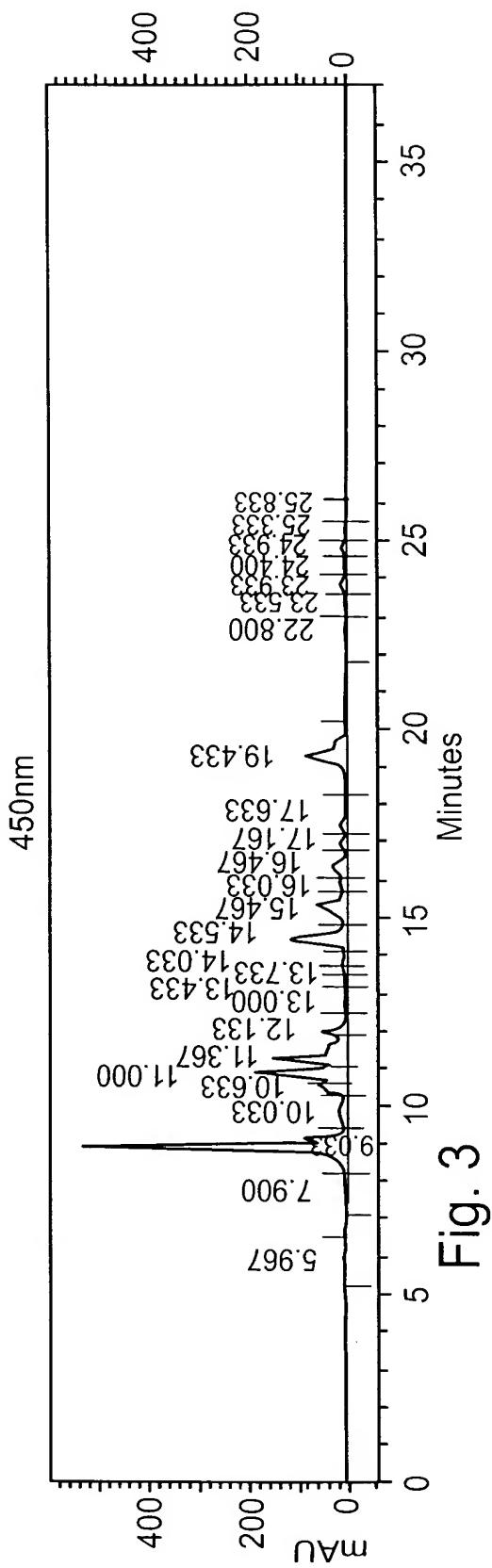


Fig. 2



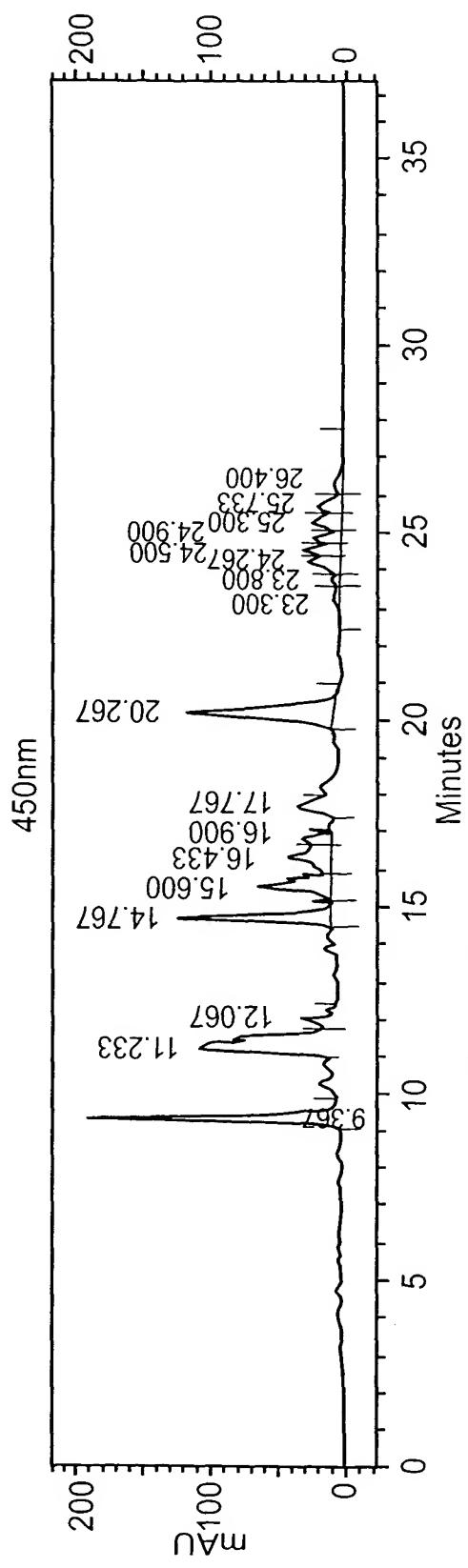


Fig. 5a

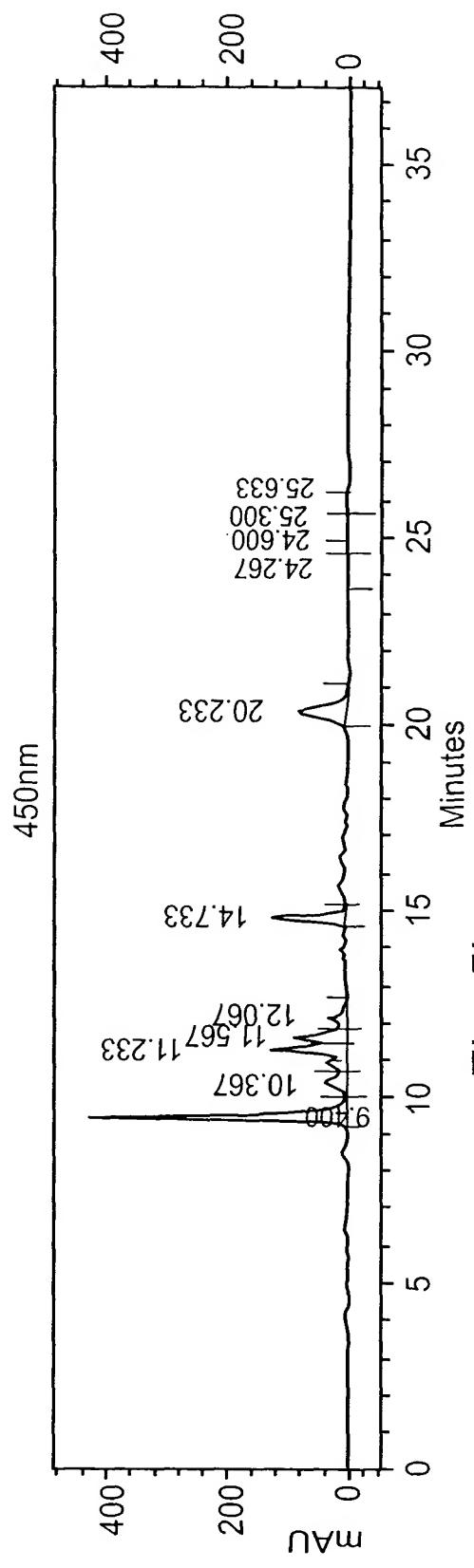


Fig. 5b

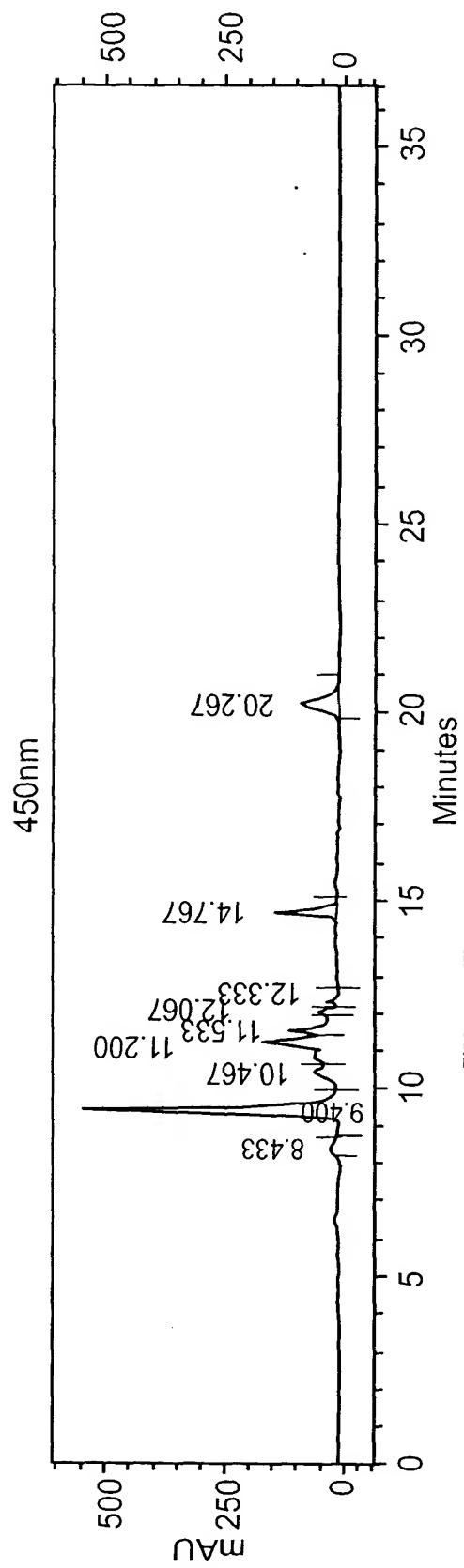


Fig. 5c

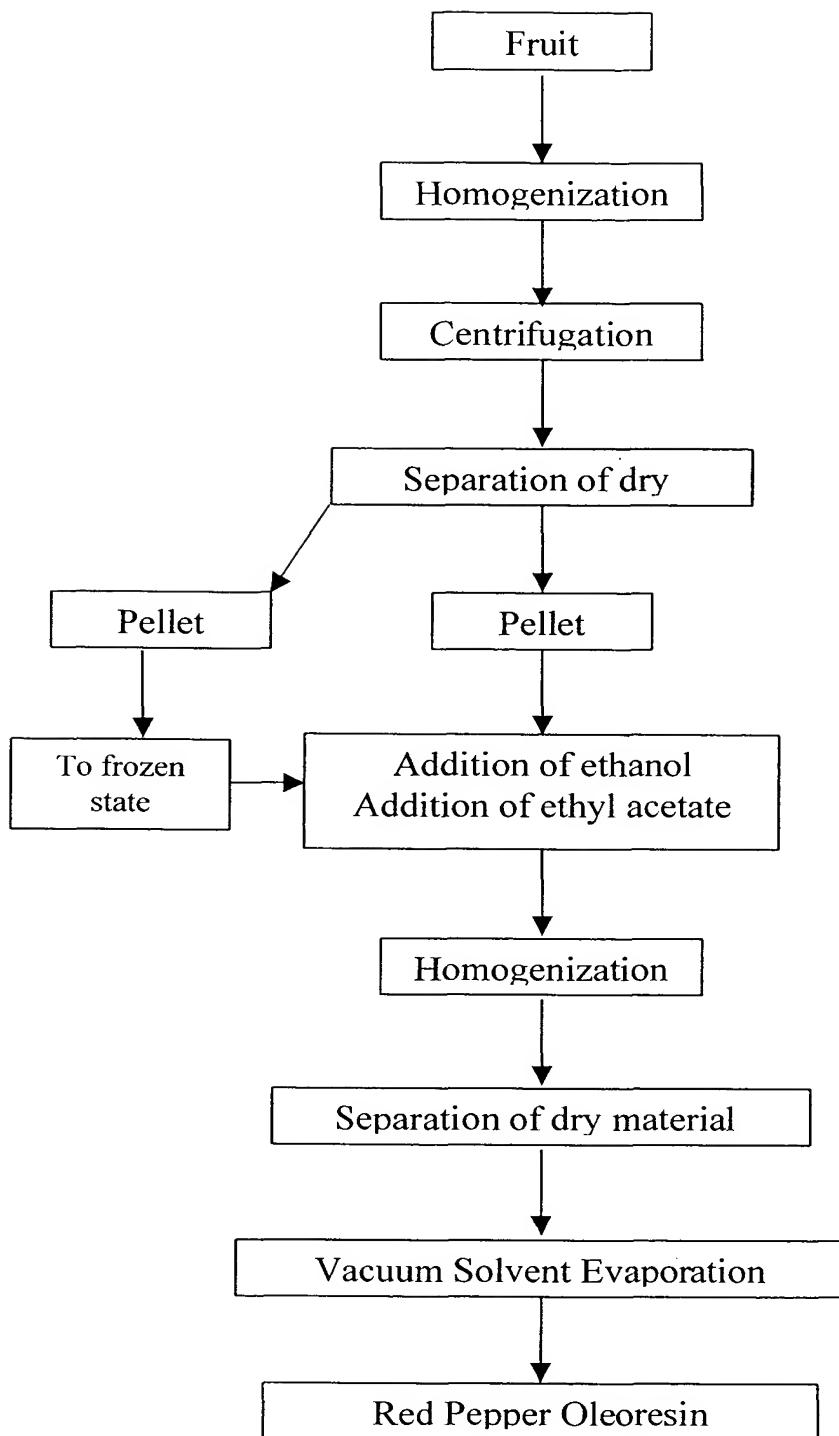


Figure 6

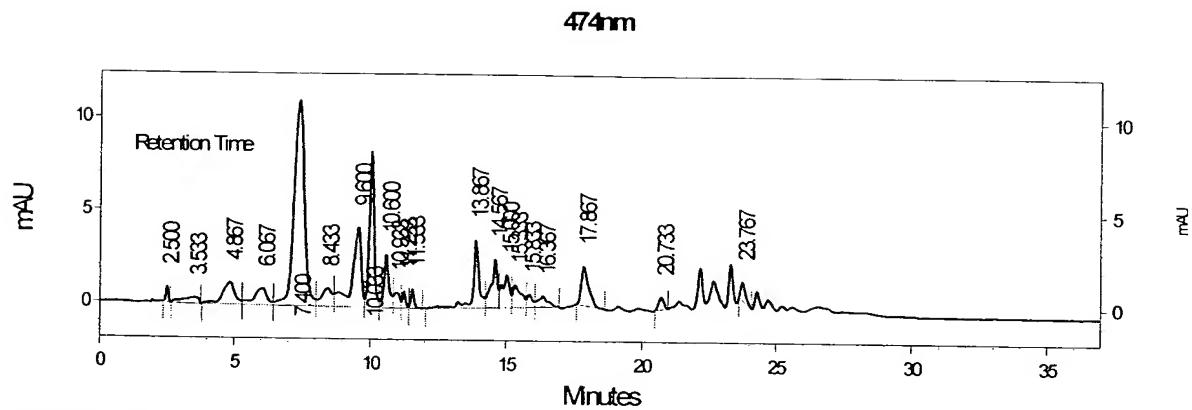


Figure 7a

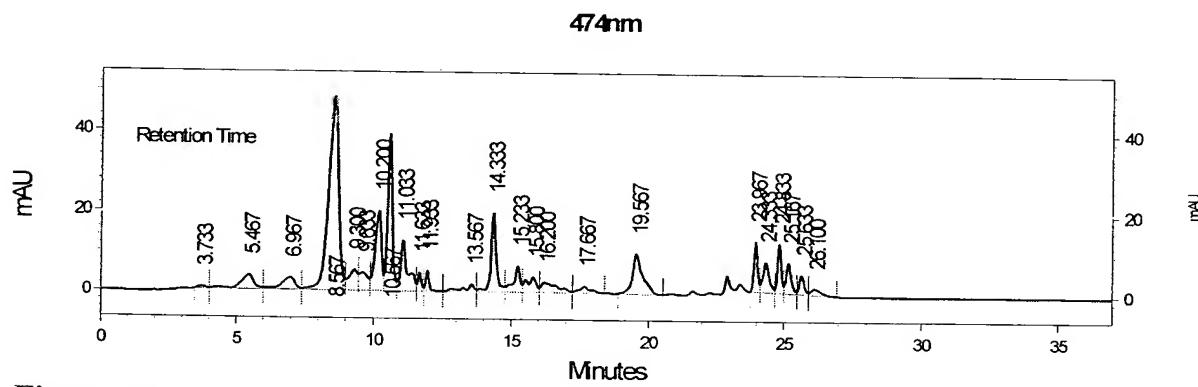


Figure 7b

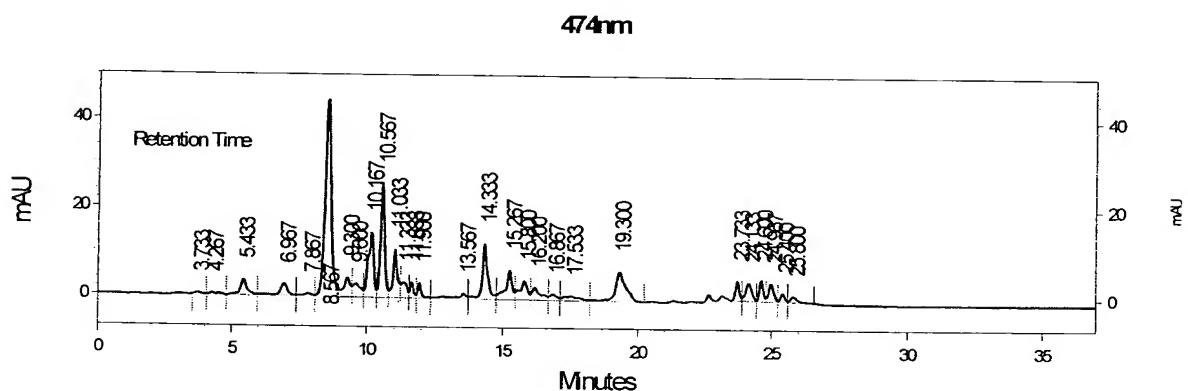


Figure 7c

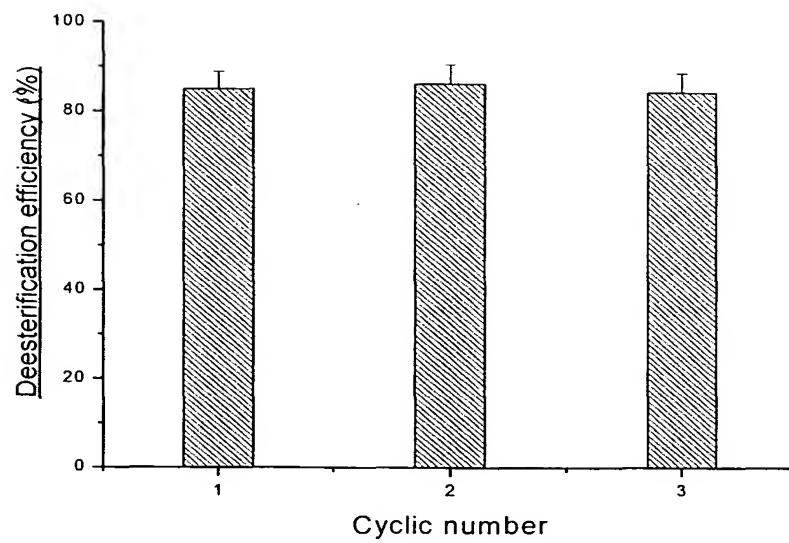


Figure 8

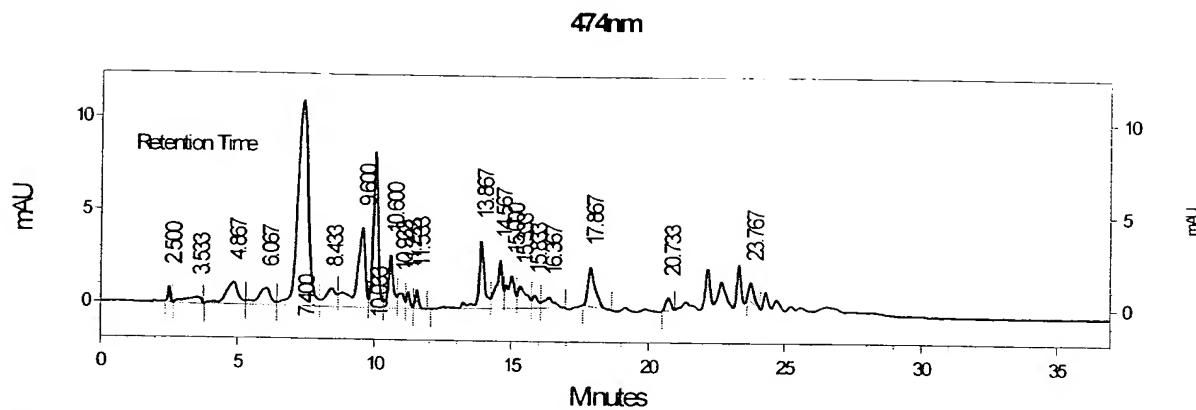


Figure 9a

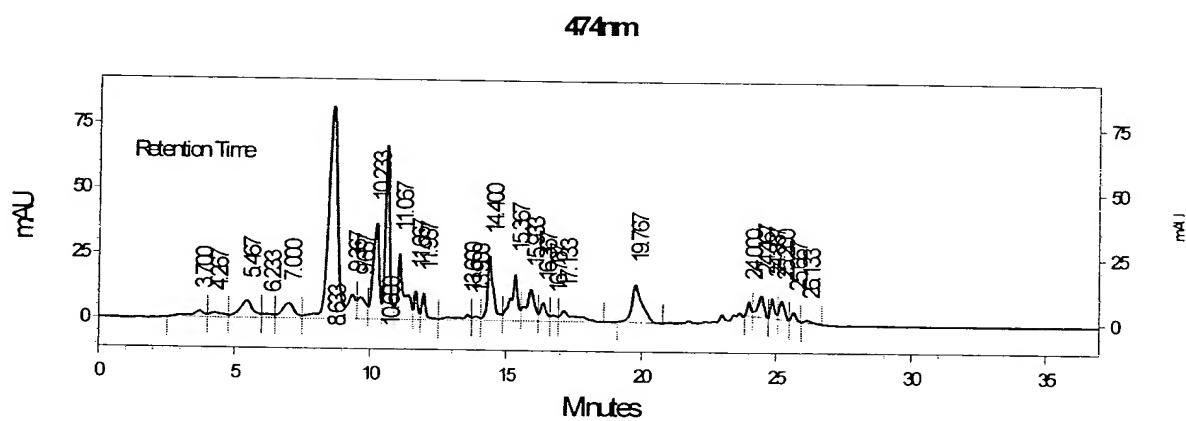


Figure 9b

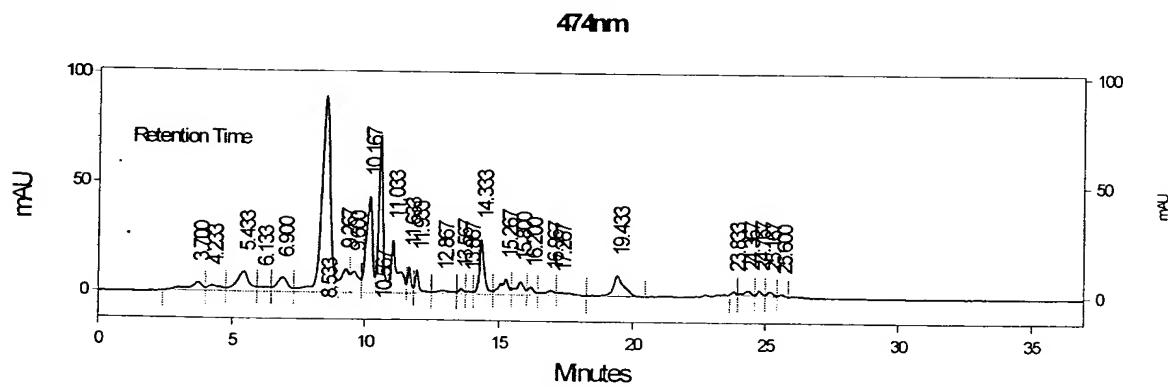


Figure 9c

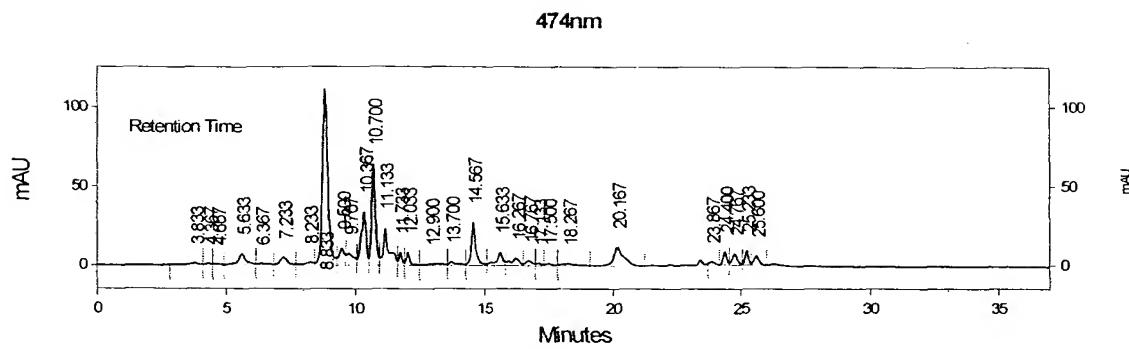


Figure 9d

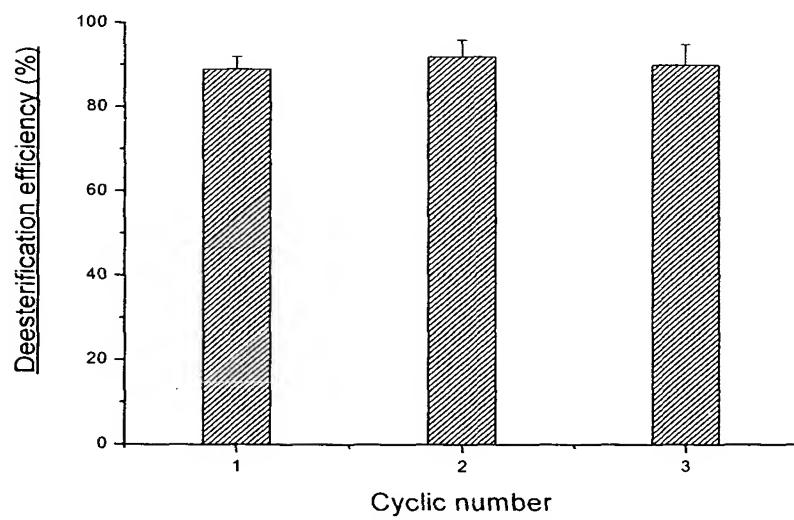


Figure 10

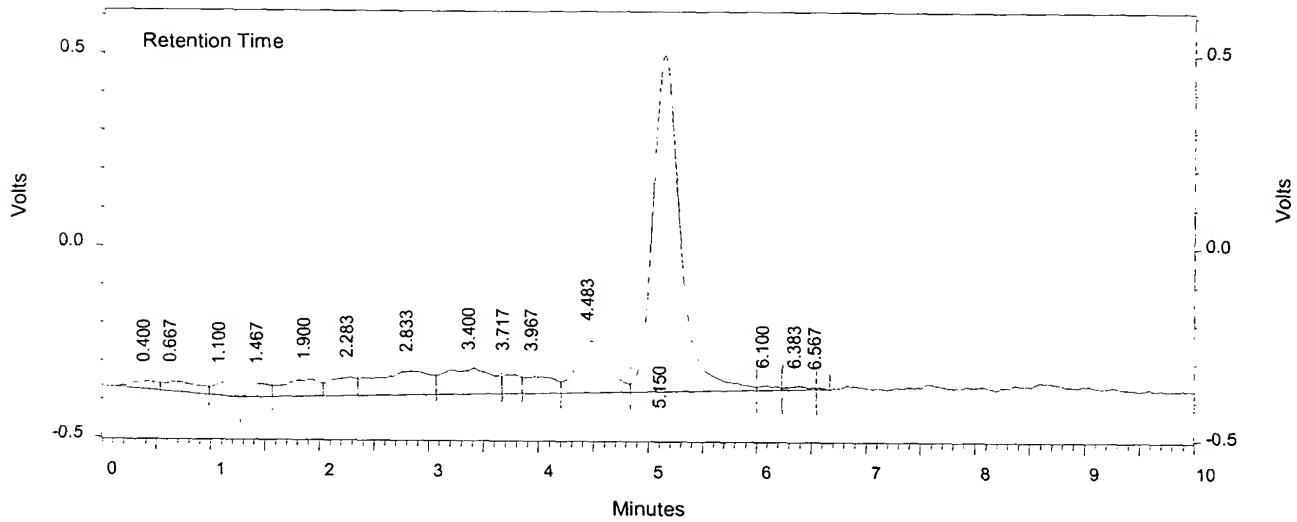


Figure 11a

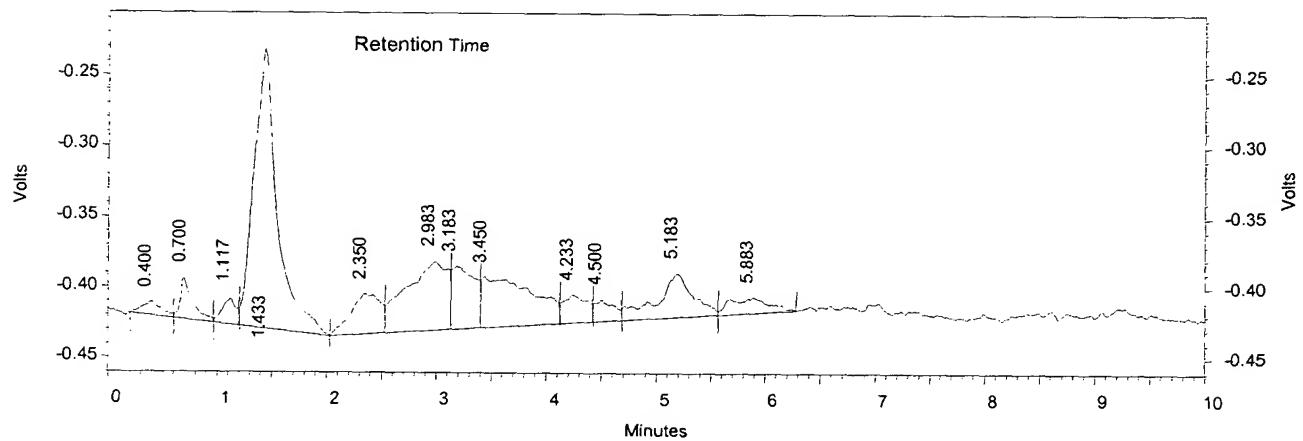


Figure 11b:

DAYS STORAGE

| <u>Emulsion</u> | <u>0 days</u> | <u>10 days</u> | <u>20 days</u> | <u>30 days</u> |
|--|----------------------|-----------------------|-----------------------|-----------------------|
| Deesterified oleoresin 0.15% Tween | 1.402 | 1.377 | 1.317 | 1.216 |
| Deesterified oleoresin 0.03% Tween | 1.352 | 1.326 | 1.206 | 1.147 |
| Untreated oleoresin 0.15% Tween | 1.220 | 1.159 | 1.17 | 1.061 |
| Untreated oleoresin 0.03% Tween | 0.912 | 0.662 | 0.618 | 0.621 |

Note: Values in OD at 474 nm

Figure 12

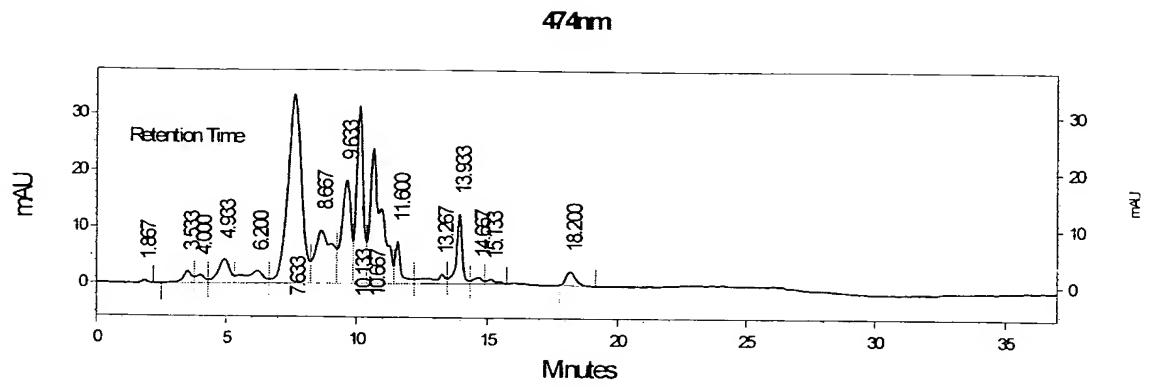


Figure 13a

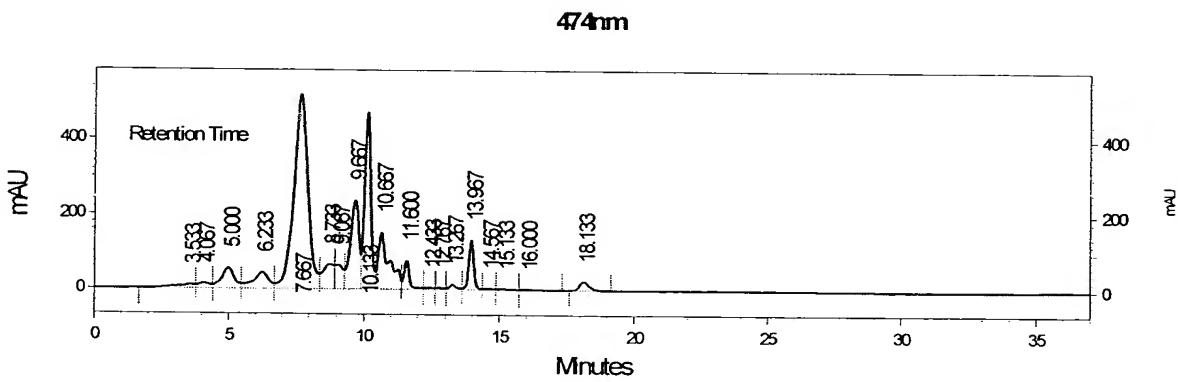


Figure 13b

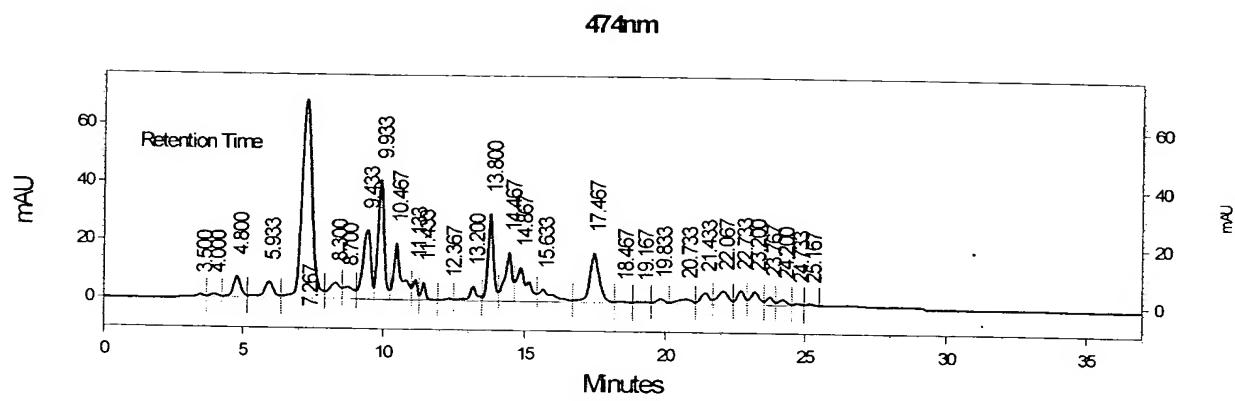


Figure 13c

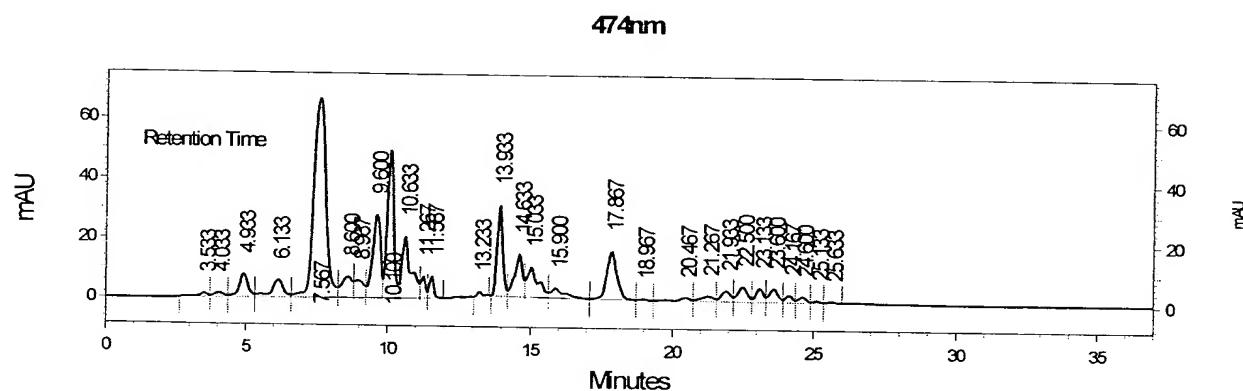


Figure 13d

Figure 14a Extraction of deesterified oleoresin with and without alkaline conditions: Carotenoids, %composition.

| CAROTENOID | pH adjusted | Without pH adjustment |
|-------------------------|-------------|-----------------------|
| Capsorubin | 1.22±0.23% | 1.08±0.20% |
| Violaxanthin | 2.36±0.21% | 2.13±0.30% |
| Capsanthin | 42.20±1.30% | 38.73±1.10% |
| Zeaxanthin+ capsolutein | 19.33±0.74% | 17.62±0.80% |
| β cryptoxanthin | 5.94±0.33% | 6.38±0.40% |
| β carotene | 7.97±0.20% | 8.50±0.32% |
| Other Carotenoids | 20.98±3.01% | 25.56±3.12% |

Figure 14b Extraction of deesterified oleoresin with and without alkaline conditions: mg/gram deesterified extract.

| Carotenoid | pH adjusted | Without pH adjustment |
|--|------------------------------|-----------------------------|
| Capsorubin | 2.56±0.48 | 0.81±0.15 |
| Violaxanthin | 4.95±0.44 | 1.59±0.22 |
| Capsanthin | 88.6±2.73 | 29.00±0.825 |
| Zeaxanthin+ capsolutein | 40.59±1.55 | 13.20±0.60 |
| β cryptoxanthin | 12.47±0.69 | 4.78±0.30 |
| β carotene | 16.73±0.42 | 6.37±0.31 |
| Other Carotenoids | 44.00±6.30 | 19.17±2.34 |
| Total carotenoids | 209.9±12.61 | 74.92±4.74 |
| Enrichment (deesterified/untreated) | 2.84 fold (209.9/74 mg/g) | 1.01 fold (74.9/74 mg/g) |
| Vitamin E | 20.30 | 5.00 |
| Enrichment (deesterified/untreated) | 3.7 fold (20.3/5.5 mg/g) | 0.9 fold (5.0/5.5 mg/g) |

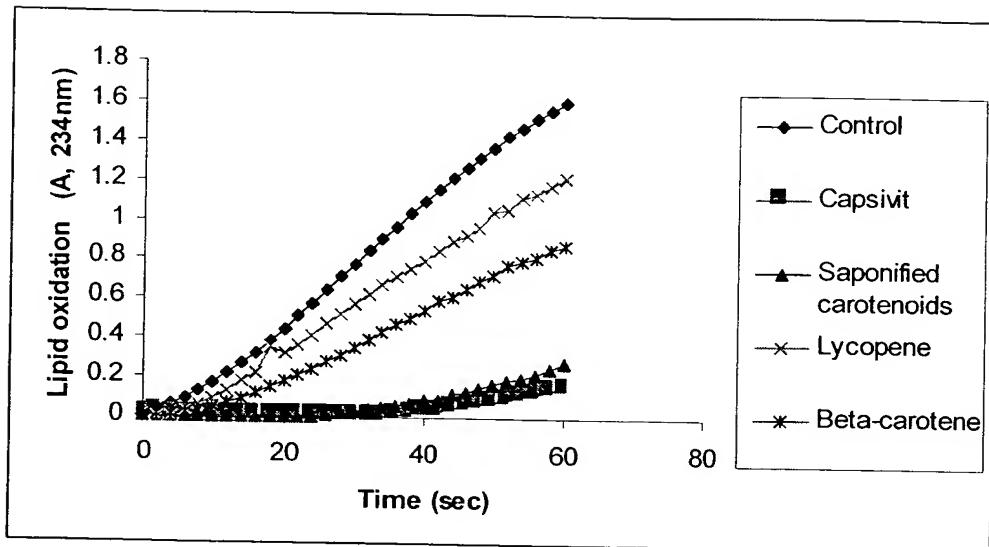


Figure 15a

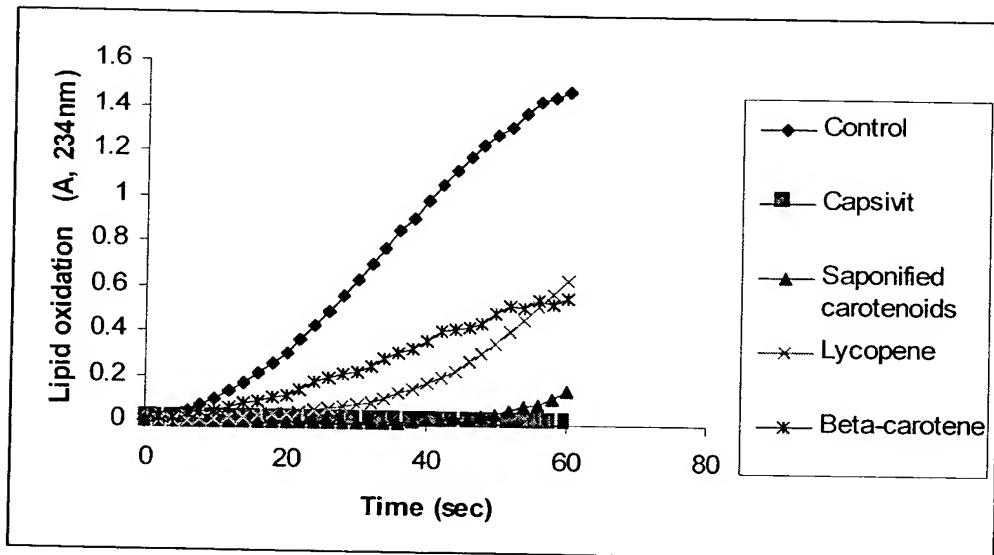


Figure 15b

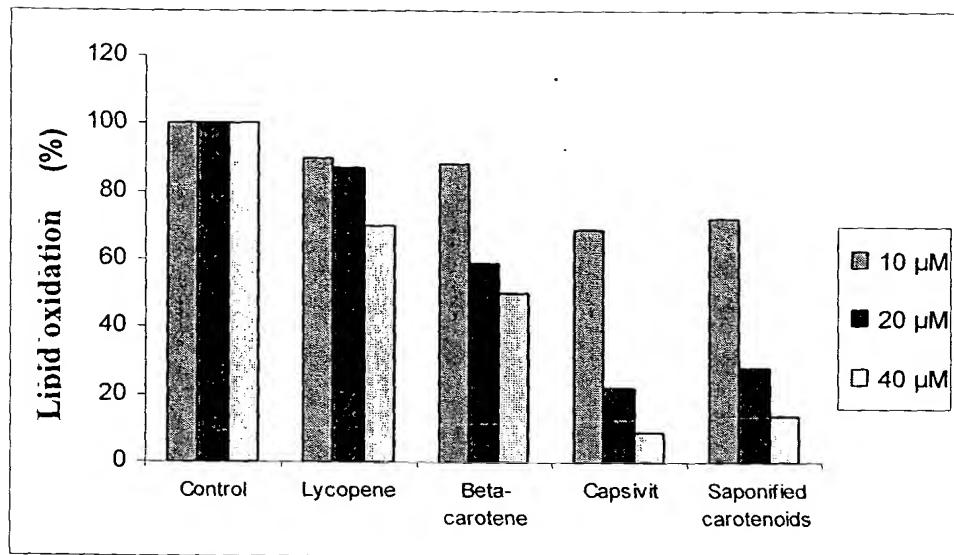


Figure 16a

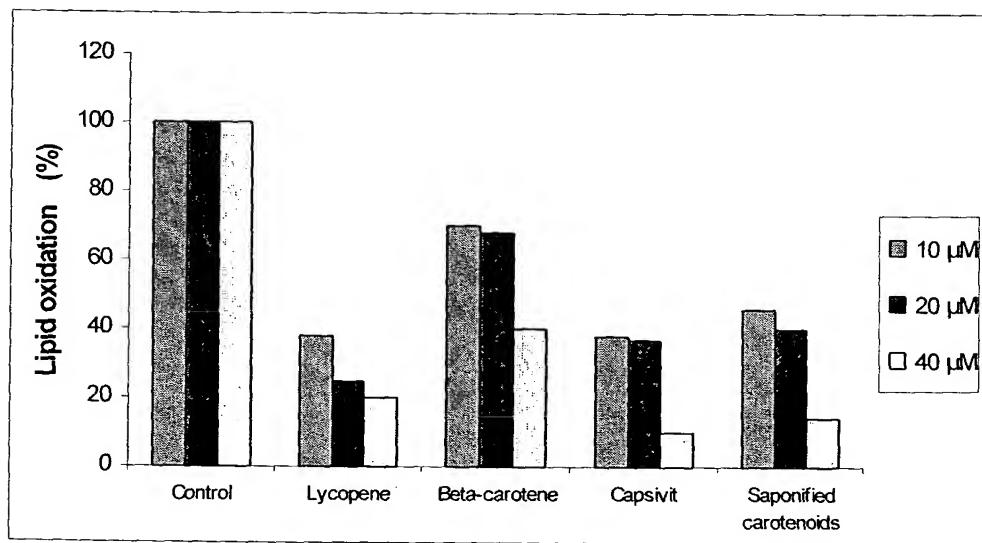


Figure 16b

Figure 17 Enzymatically deesterified carotenoids: %composition (wt/wt):

| Component | Without Vitamin E depletion | Vitamin E depletion by Florisil column |
|-------------------------|-----------------------------|--|
| Capsorubin | 1.22±0.23% | 1.68±0.20% |
| Violaxanthin | 2.36±0.21% | 2.70±0.30% |
| Capsanthin | 42.20±1.30% | 46.00±2.10% |
| Zeaxanthin+ capsolutein | 19.33±0.74% | 19.70±0.80% |
| β cryptoxanthin | 5.94±0.33% | 5.50±0.40% |
| β carotene | 7.97±0.20% | 3.89±0.33% |
| Other Carotenoids | 20.98±3.01% | 20.53±4.13% |
| Total carotenoids | 210.00±10.30mg/g | 204.00±6.30mg/g |
| Vitamin E | 20.30 mg/g | 0.50mg/g |